

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in this application.

1-10. (Canceled)

11. (Original) A network communication system comprising:

a master device for initiating a request message;

an input/output slave device being exclusively responsive to the request message of the master device;

an adapter device directly attached to a body of the slave device, the adapter device comprising an interface circuit for transmitting a response message to the master device in response to the request message received on a preregistered TCP port selected from a plurality of TCP ports, the response message correlating to an output received from the slave device, the adapter device configured to directly attach to an in-data port and an out-data port of the body of the slave device; and

an optimal protocol utilized to communicate the request message and the response message between the master device and the adapter device, the optimal protocol comprising:

an IP protocol;

a TCP protocol; and,

an application layer protocol wherein building and parsing of the response message is responsive to a first part of the request message.

12. (Original) The network communication system of claim 11 wherein the application layer protocol is MODBUS.

13. (Original) The network communication system of claim 11 wherein the response message is responsive to the content of the first part of the request message.

14. (Original) The network communication system of claim 11 wherein the master device exclusively initiates the request message.

15. (Original) The network communication system of claim 11 further comprising a set of predetermined response messages including at least one predetermined response message, each predetermined response message being distinguishable by the first part of the request message wherein the predetermined response message is determined from the content of the first part of the request message and rapidly selected for quickly responding to the request message.

16. (Original) The network communication system of claim 15 wherein the set of predetermined response messages comprises a response message to an address resolution protocol request message.

17. (Original) The network communication system of claim 15 wherein the set of predetermined response messages comprises a response message to an Internet control management protocol request message.

18. (Original) The network communication system of claim 15 wherein the set of predetermined response messages comprises a response message to a TCP connection request message.

19. (Original) The network communication system of claim 15 wherein the set of predetermined response messages comprises a response message to a TCP disconnect request message.

20. (Original) The network communication system of claim 15 wherein the set of predetermined response messages comprises a response message to a MODBUS request message as a TCP data frame.

21. (Original) The network communication system of claim 11 wherein each device limits its message to a length that is less than both a TCP transaction length and a maximum transmission unit.

22. (Original) The network communication system of claim 11 wherein the optimal protocol exclusively utilizes a TCP port number 502.

23. (Original) The network communication system of claim 22 wherein any message not transmitted via the TCP port number 502 is ignored.

24. (Original) A high performance Ethernet module comprising:

an Ethernet controller operably coupled to a network connection;

a control processing unit operably coupled to the Ethernet controller and directly attached to a factory automation device;

a preregistered TCP port selected from a plurality of TCP ports for receiving messages over the network connection; and,

an optimal communication stack that executes on the control processing unit, the optimal communication stack being capable of processing a TCP protocol, an IP protocol and an application layer protocol using a state machine, the processing further including building and parsing a communication message dependent upon a predetermined index of the message and creating a pre-calculated response message.

25. (Original) The Ethernet module of claim 24 wherein the application layer protocol is MODBUS.

26. (Original) The Ethernet module of claim 25 wherein the communication message is limited to a length that is less than both a TCP transaction length and a maximum transmission unit.

27. (Original) The Ethernet module of claim 24 wherein the optimal communication stack is configured to quickly provide the response message responsive to a request message.

28. (Original) The Ethernet module of claim 27 wherein the communication message further comprises the request message having a first portion and the response message being responsive to the first portion of the request message wherein the response message is determined from the content of the first portion of the request message and rapidly selected for responding to the request message.

29. (Original) The Ethernet module of claim 27 wherein the communication message is limited to a length that is less than both a TCP transaction length and a maximum transmission unit.

30. (Original) The Ethernet module of claim 24 wherein the communication protocol exclusively utilizes TCP port number 502 as the preregistered TCP port.

31. (Canceled).